SPARKS

Daytona Section Newsletter
April 2017

APRIL SECTION MEETING

Thursday April 27th at the Halifax River Yacht Club, 6:00 PM
331 South Beach Street, Daytona Beach, Florida 32114

PRESENTATION TOPIC
STUDENT PRESENTATIONS
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CHAIR'S REPORT

Happy April to one and all. April is the month that brought forth such diverse talents as Leonardo Da Vinci (1452), John Muir (1838), Robert Oppenheimer (1904), and Claude Shannon (1916). For the Daytona Section, April is also the month that brings the last, and often most popular, section meeting before the summer break. We will celebrate ERAU and Volusia County students who are becoming young standouts in the STEM fields. Details are in the meeting section of the newsletter.

We've had a productive spring. The EWeek celebration was a success, our monthly meetings are well attended, we are integrating the Small Radio Telescope with the new MicaPlex research facility at ERAU, and we were represented at Florida Council and SoutheastCon events.

Though the Section will not meet during the summer I hope to continue to coordinate with the ExCom as we work to increase our membership and provide more service to the local community. (Yes, that was a warning, ExCom members!)

Wherever your summer takes you, be safe and have fun.

Keith

APRIL PRESENTATION

We will have two teams from ERAU presenting this year.

Augmented Reality HUD for Aircraft Visual Tracking

A diverse team of students from the Electrical, Computer, Software, and Systems Engineering department's capstone design course are working together to develop a wearable display (Microsoft Hololens) that assists a ground-based observer in visually locating and tracking local air traffic. The system utilizes a software defined radio connected to a small single-board computer to capture ADS-B messages from aircraft within the vicinity, which is then processed and re-broadcast to the Hololens where the user's display is updated to highlight the aircraft and provide relevant aircraft information including flight level and call-sign. The use case for this product is to aid visual observers monitoring unmanned aircraft systems operations to ensure that their vehicle remains well clear of other local air traffic.

EcoCar Advanced Driver Assistance System (ADAS)

As part of the Embry-Riddle Aeronautical University's EcoCAR team, the Advanced Driver Assistance System (ADAS) is under development with a team of students from the Electrical, Computer, Software, and Systems Engineering Department's senior design course. The ADAS system is comprised of a computer vision system and user interface. The computer vision system must alert the user to and/or identify road infrastructure elements including stop signs, speed limit signs, lane lines, pedestrians, other vehicles, and traffic signals. An Android Auto mobile application running on-board the team's Chevrolet Camaro presents alerts and other pertinent details to the driver.

In addition, our Daytona Section student winners at the 2017 Tomoka Science and Engineering Fair will be introduced to our membership.

OUR MARCH PRESENTATION

Dr. Al Helfrick's presentation "A Night of Potpourri with the Old Professor" was another combination of aviation and technology history, observation and whimsy during his vast and diverse career in the military, corporate and academic sectors. It covered a brief history of early flight, navigation and communication with examples and historical photos. There were times when those of us who started our careers in the "vacuum tube" age could relate to the problems and issues of the times. The presentation was also enjoyed by our non-technical guests who saw how technology improved and advanced the aviation experience.

Dr. Helfrick contemplating and making his presentation

Dr. Helfrick being presented with our sections new IEEE travel mug

ANOTHER TALE FROM THE OLD PROFESSOR

Would You Call a Plumber to Make Something Plumb?

I recently refurbished one of my radio towers and after re-erecting it I noticed is wasn't perfectly vertical. Hanging a big hex nut on a string from a tree branch and sighting the tower against the perfectly vertical string I determined it was about 1.5 degrees off. In the process of making a new base for the tower some slightly out-of-tolerance holes for the mounting bolts resulted in the Leaning Tower of DeLand. My calculations show that about a third of an inch distributed between the three legs of the tower managed to add up and cause the lean. Unless one really looks for it, casual observers would not notice the lean.

But whenever I look out a window and see the tower it is clear that it leans as it doesn't align with the window frame. I increased the tension on the guys on one leg of the tower and loosened the tension a bit on the remaining guys hoping to pull it vertical. The base is well anchored in the Florida sand and is not moving or certainly not much. I am resolved that I will have to live with the leaning tower.

I wondered how much lean common vertical poles or towers actually have such that no one notices. I made a point of checking radio towers and utility poles whenever I had an opportunity. Radio towers are absolutely perfectly vertical. I remember when I was a broadcasting engineer many years ago, one of my stations erected a second tower for a directional antenna array to allow us to increase our transmitter power from 1 kW to 5 kW. The crew that erected the 300-foot tower spent an entire day insuring the tower was perfectly vertical and the tensions in the guys were balanced.

My observation of wooden utility poles was an eye opener. First, the percentage of wooden utility poles that are plumb is very small. Depending on what tolerance is allowed, for all practical purposes, the percentage that are perfectly vertical is zero. In addition to not being plumb, wooden poles are not even straight. Thus, the majority of vertical “structures” that most people encounter are trees and utility poles none of which are perfectly vertical. I concluded that observers from the street would view my tower as vertical as anything else they saw that day. Therefore, I closed the blinds of the windows in my house that face the tower so I can’t see it.

Utility Poles on Grand Ave, Deland Old Professor’s Tower

What is the connection between making something plumb and plumbing? I am sure you really would like to know. Early masons and carpenters used a lead weight attached to a string to insure their structures were vertical, called a “plumb bob”. To this day, it is the method of choice to insure structures are vertical. But why lead? Lead was one of the first metals to be used by early man because it was abundant and easy to extract. It has a low melting point which makes it easy to cast items with lead. The Romans used lead to make water pipes which was probably not a good idea. But the use of lead for pipes is the etymology of the word “plumber”. The Latin name for the atomic element number 82, lead, is Plumbum, and the symbol is Pb. So, it is lead that is the connection between assuring something is vertical and pipes.

Once again, as Paul Harvey would exclaim; “Now you know the rest of the story.”

Dr. Al Helfrick, a.k.a The Old Professor

DAYTONA SECTION SHIRTS

We are pleased to offer Daytona Section polo shirts for our Section members. The shirts are embroidered with the IEEE Logo and DAYTONA SECTION on the left and your name and grade, if desired, on the right. The shirt is a high quality 5 oz, 65/35 poly/cotton pique in Royal Blue with white embroidery. Available in S - 2XL in men's as well as ladies sizes. Price is $29, including tax, for S-XL size's, 2XL size is $3 additional.
For more information or to order shirts contact: Allan Jusko 386-671-3706 or a.jusko@ieee.org.

EDITORS NOTES

The **SPARKS** newsletter is also available on our website **http://www.ieee.org/go/daytona**

Other web sites of note

Region 3 website
http://www.ewh.ieee.org/reg/3/

Melbourne Section website
www.ieeemelbourne.org

Orlando Section website
www.ieee.org/orlando

FUTURE MEETING DATES:

The dates for the fall 2017 spring session are:
Sept 28, Oct 26 and Nov 30

IEEE MEMBERSHIP PINS

Membership pins are available for all member grades. Check out this website for more information.

http://www.ieee.org/membership_services/membership/products/pins.html

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ENGINEERING HUMOR

Normal people believe that if it ain't broke, don't fix it.

Engineers believe that if it ain't broke, it probably doesn't have enough features yet.

APRIL 2017 MEETING

Thursday APRIL 27TH at the Halifax River Yacht Club
331 South Beach Street, Daytona Beach, Florida 32114
Just south of the Fire Station at the corner of Beach and Orange Streets

TOPIC– Student Presentations **SPEAKER –** ERAU students

AGENDA
5:30 PM Greetings & Cocktails
6:00 PM Dinner
7:00 PM Presentation

Dinner Menu

Italian Buffet

The dinner price includes roll and butter, salad, dinner, coffee or tea, gratuity and tax

Members and guests $20.00 each. Students $10.00 each

Please contact Allan Jusko by Wednesday April 26th at noon to give us a count for dinner or for further information

If you make reservations and are unable to attend, call prior to the event to cancel.

The Section is charged for all dinners ordered, please let us know if your plans change

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